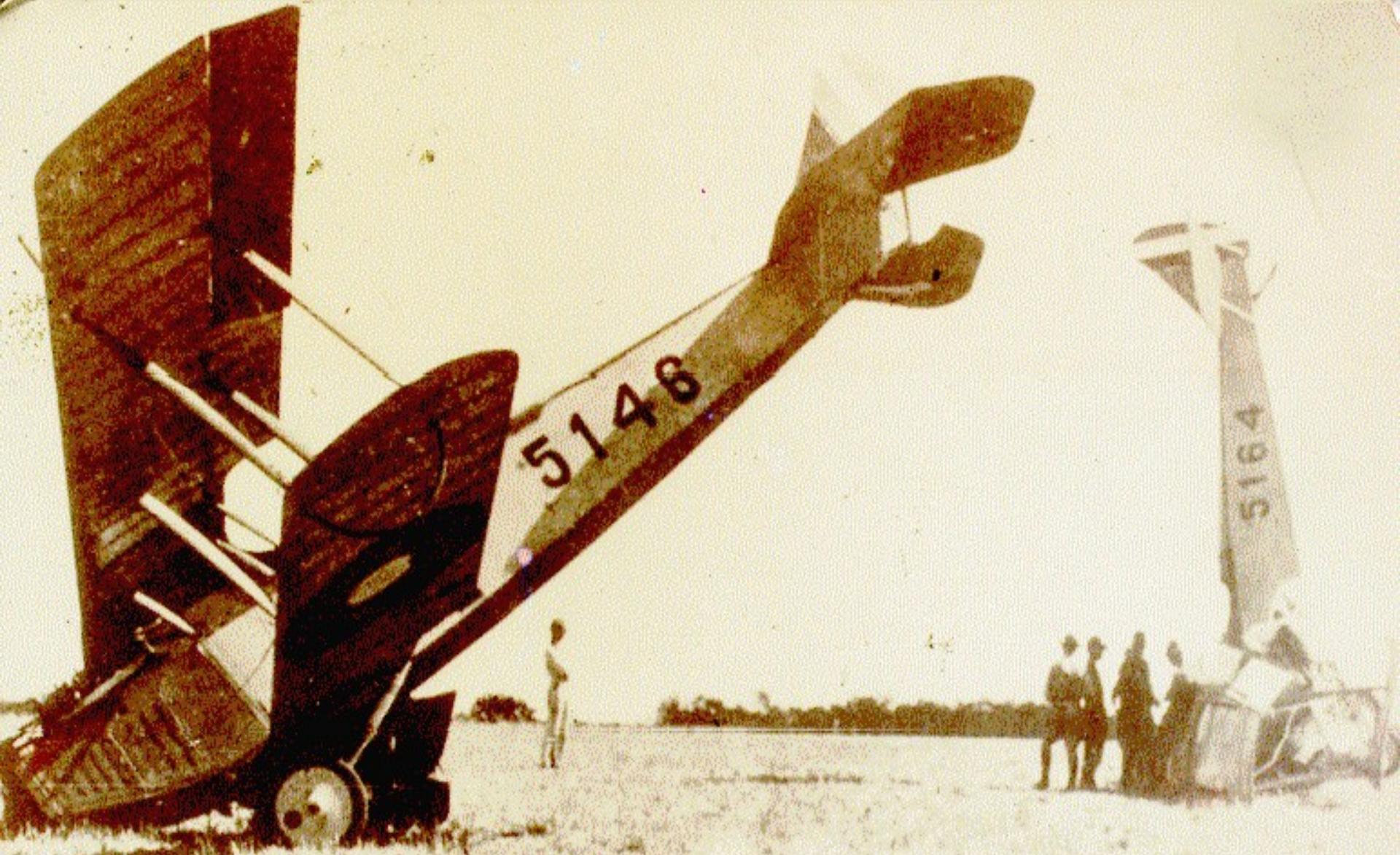


# **HUMAN FACTORS ANALYSIS AND CLASSIFICATION SYSTEM (HFACS)**



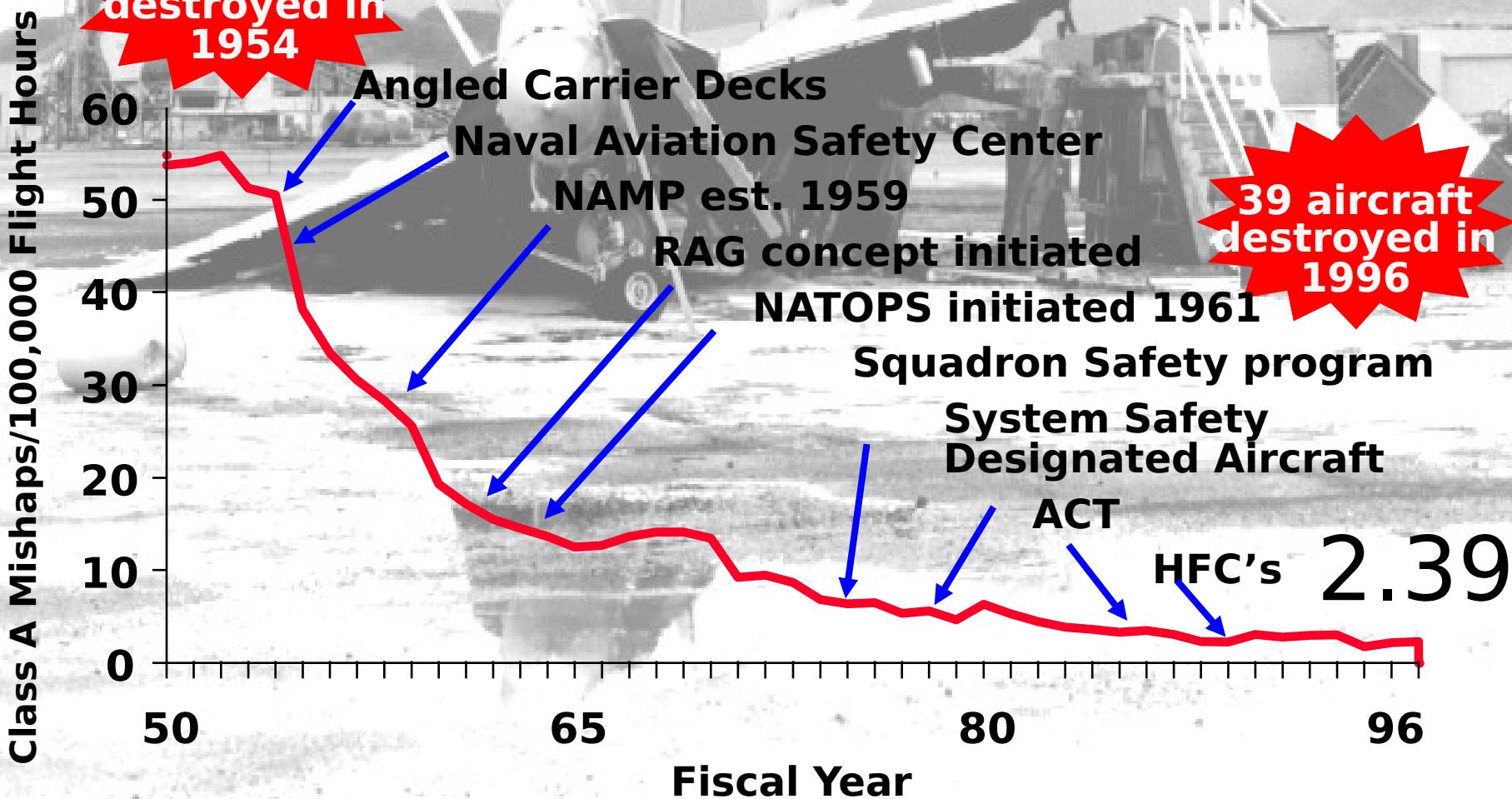
**THE FIRST STEP IN THE  
RISK MANAGEMENT  
PROCESS**



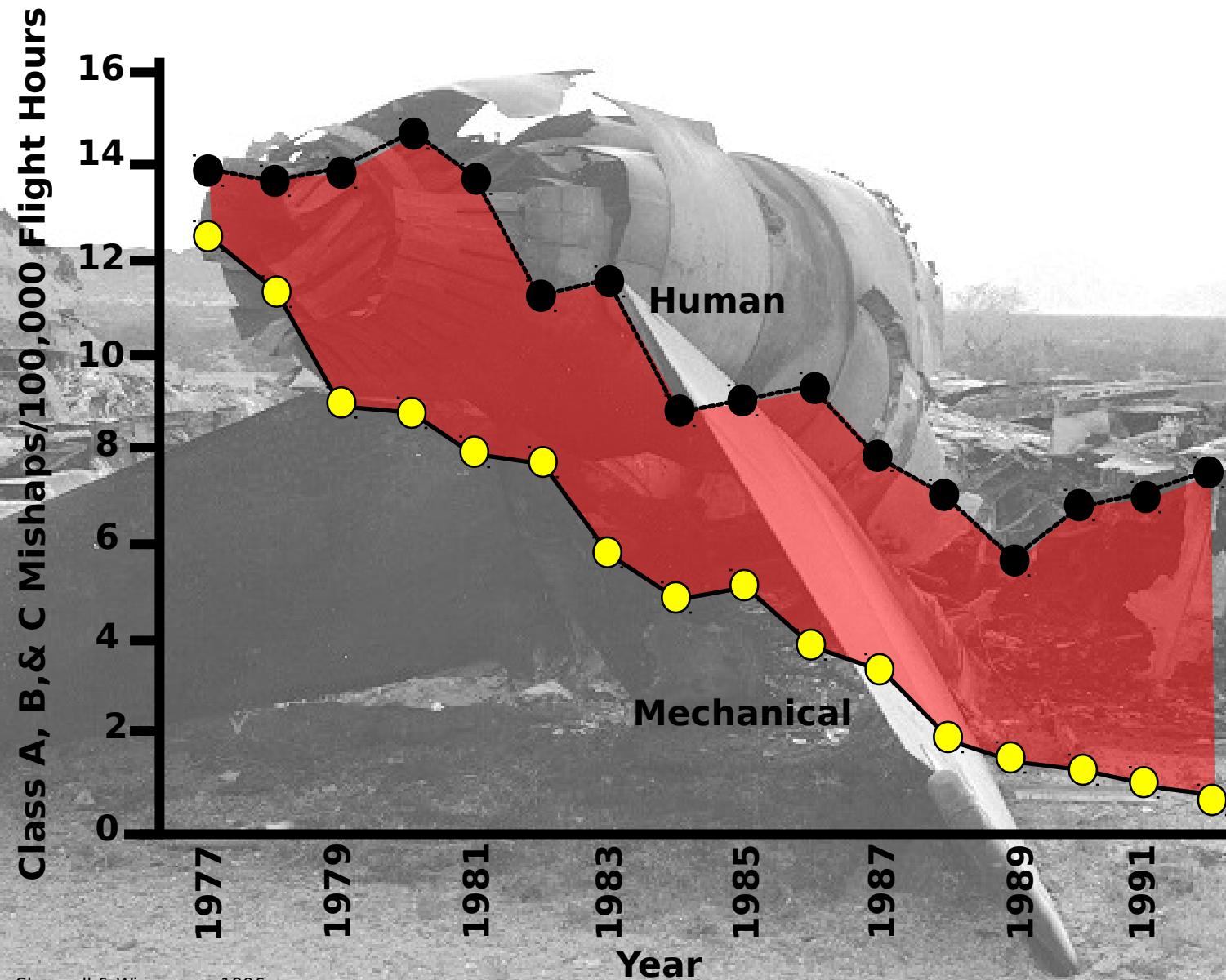
**“Human beings by their very nature make mistakes; therefore, it is unreasonable to expect error-free human performance.”**

# NAVAL AVIATION MISHAP RATE

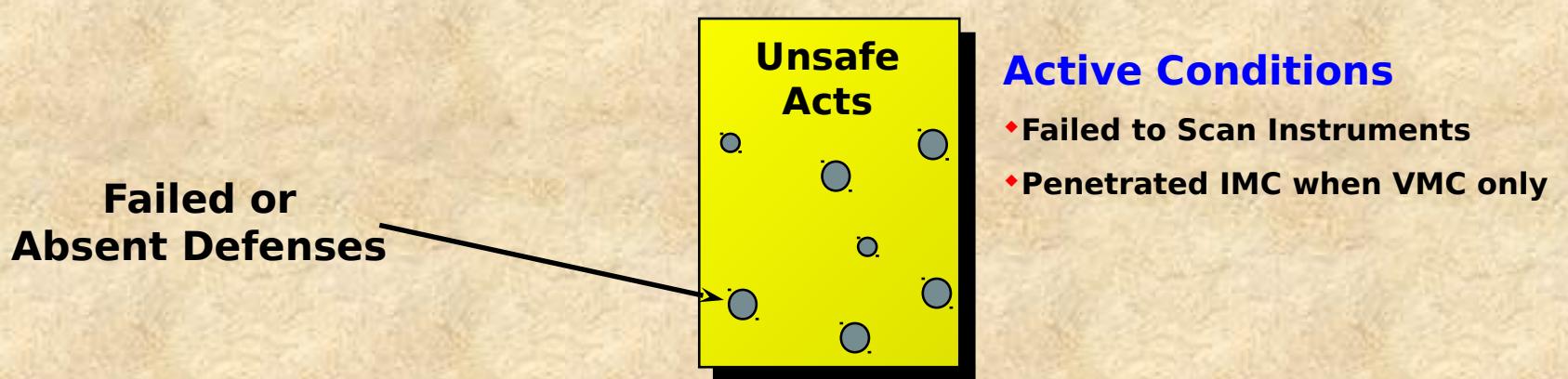
FY 50-96



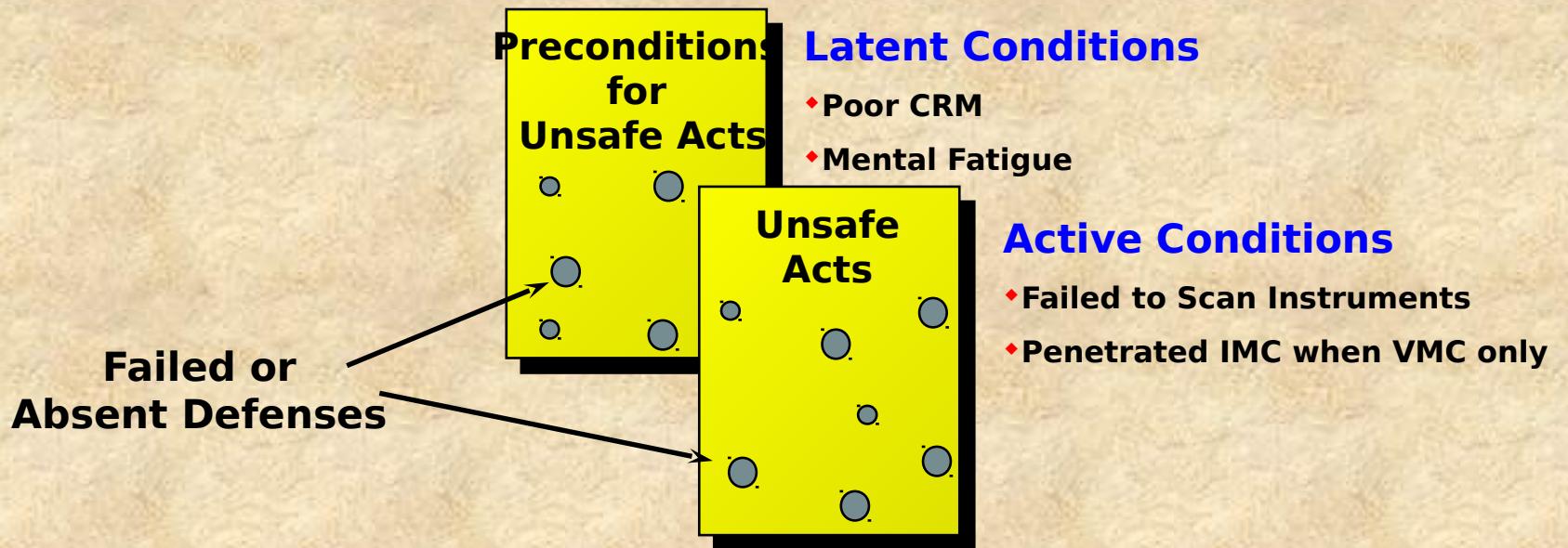
# All NAVY/MARINE Class A, B, & C Mishaps



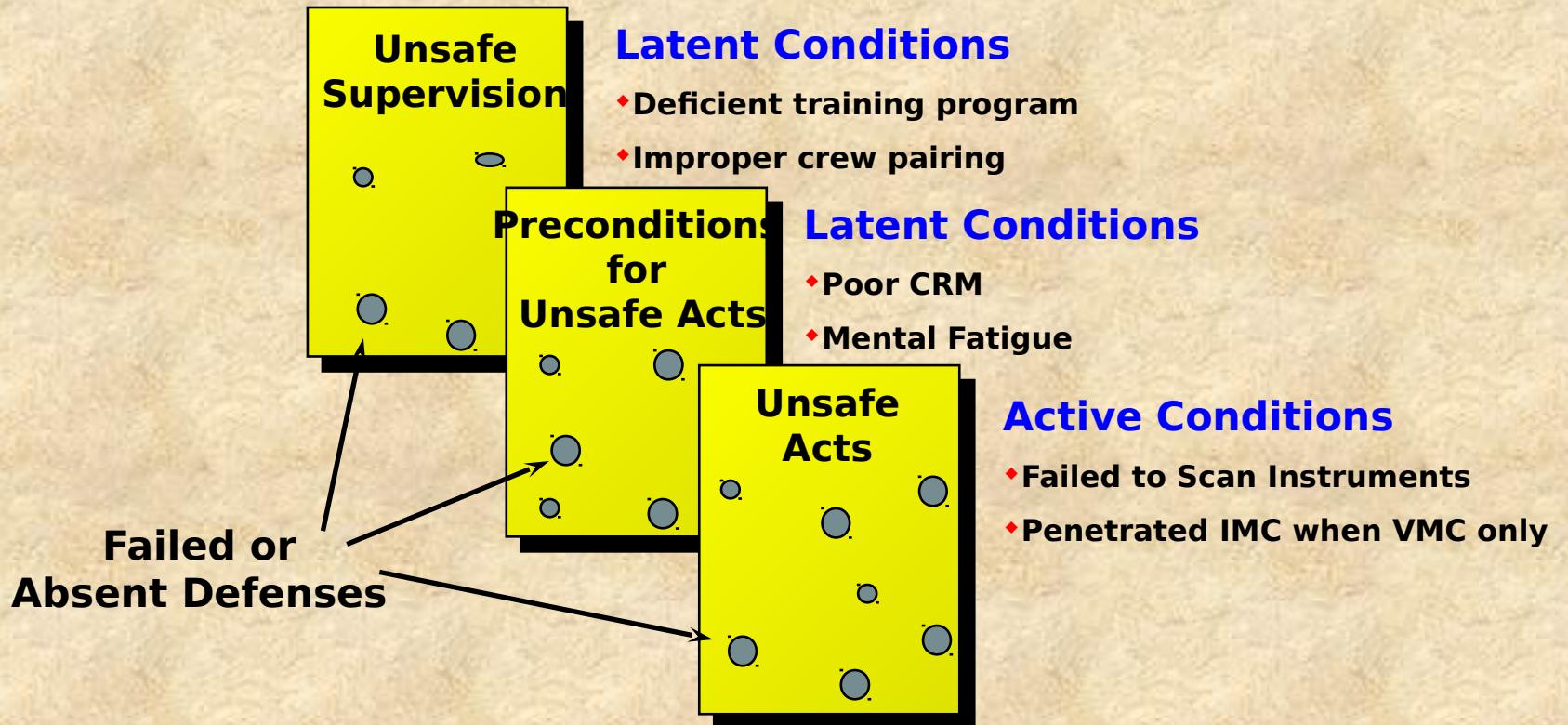
# Active versus Latent Failures (Reason, 1990)



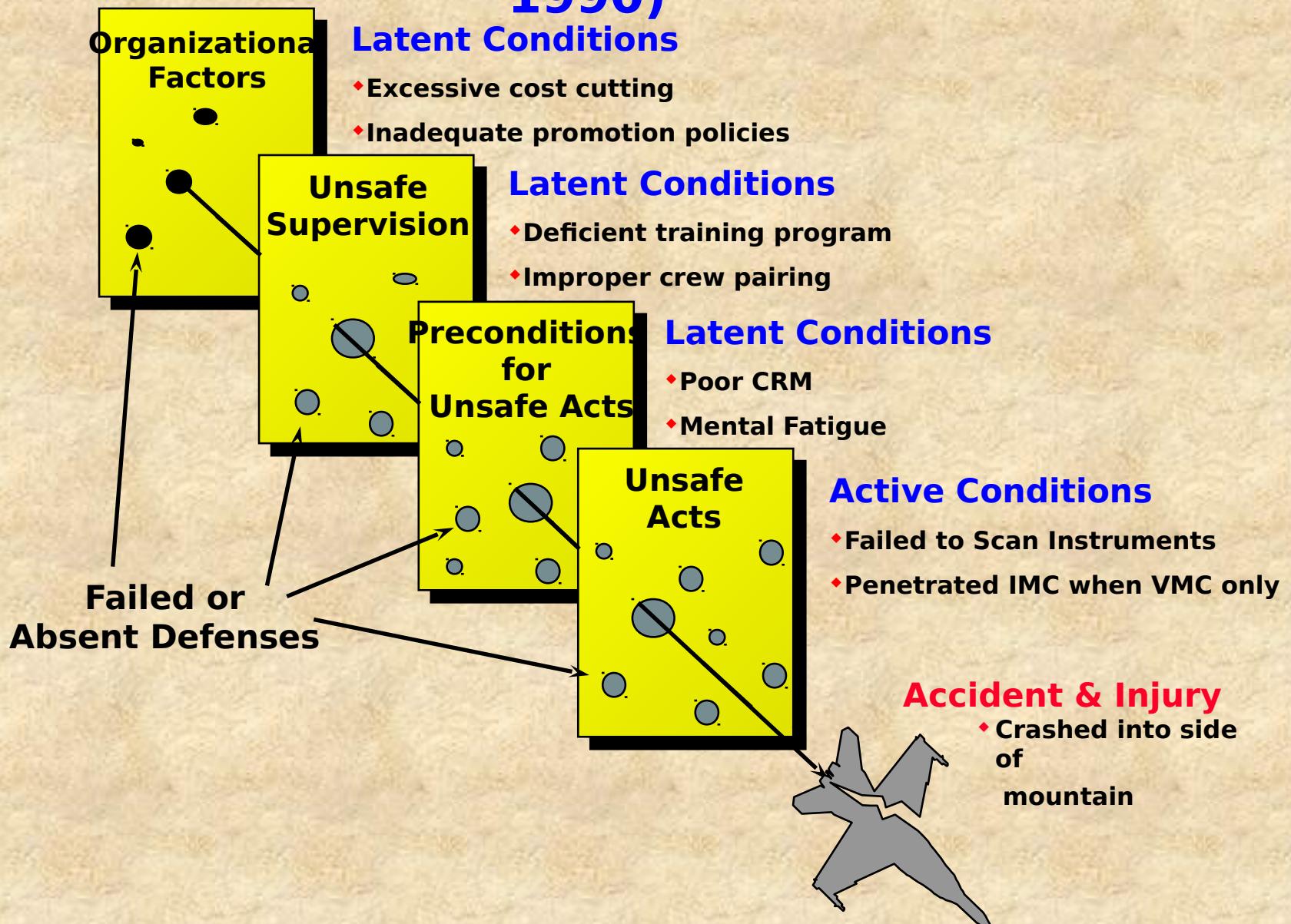
# Active versus Latent Failures (Reason, 1990)

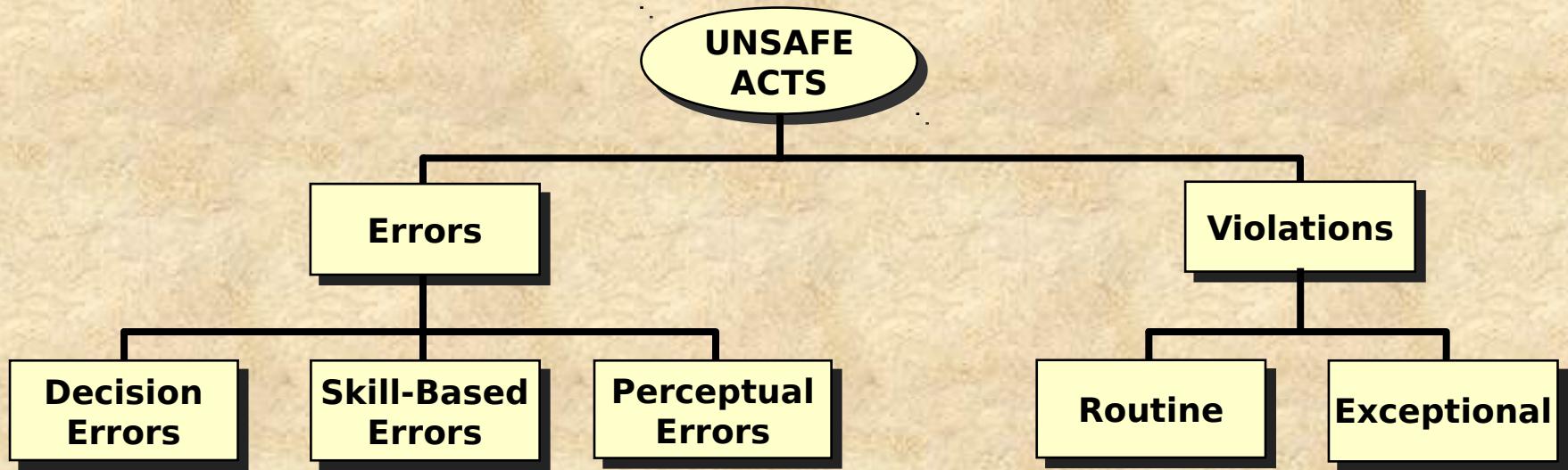


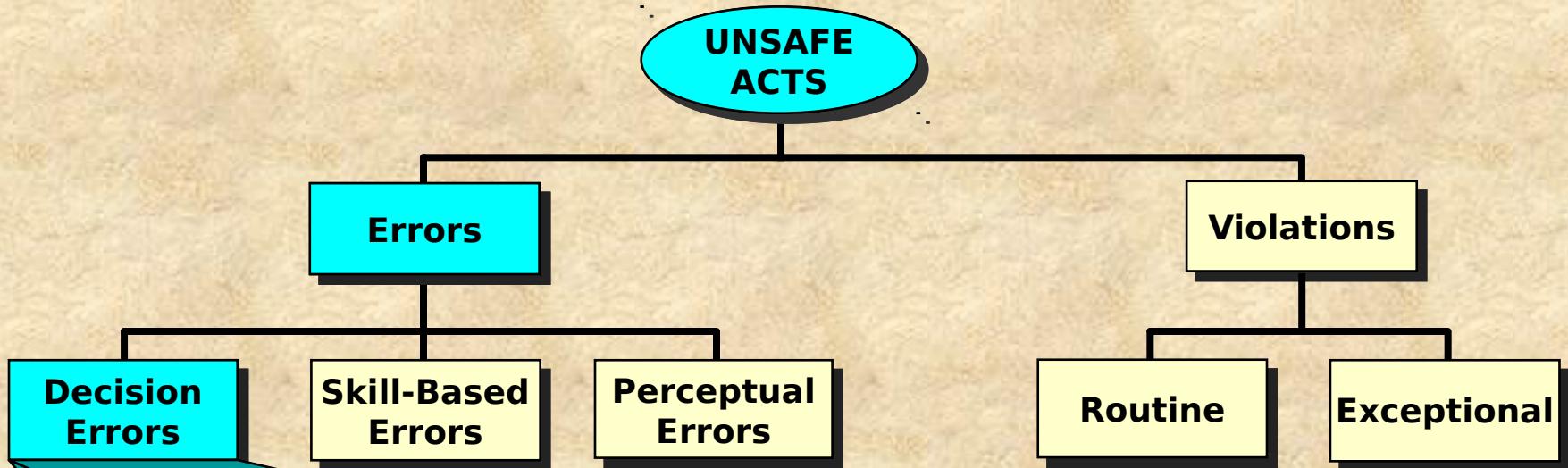
# Active versus Latent Failures (Reason, 1990)



# Active versus Latent Failures (Reason, 1990)



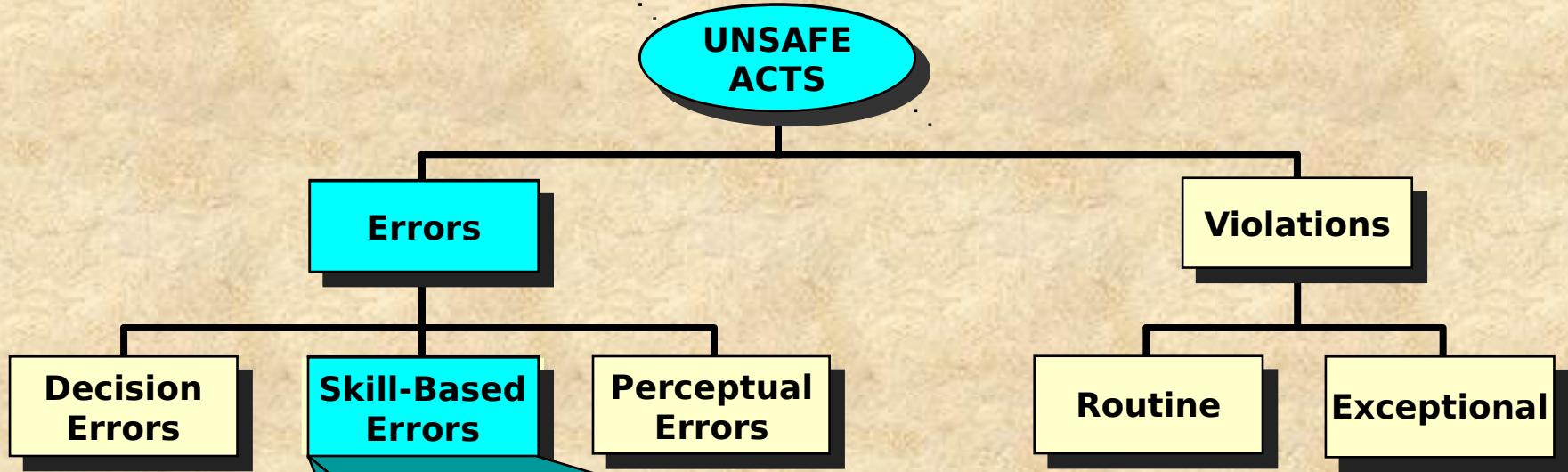




## DECISION ERROR

- **Rule-based Decisions**
  - If X, then do Y
  - Highly Procedural
- **Choice Decisions**
  - Knowledge-based
- **III-Structured Decisions**
  - Problem solving

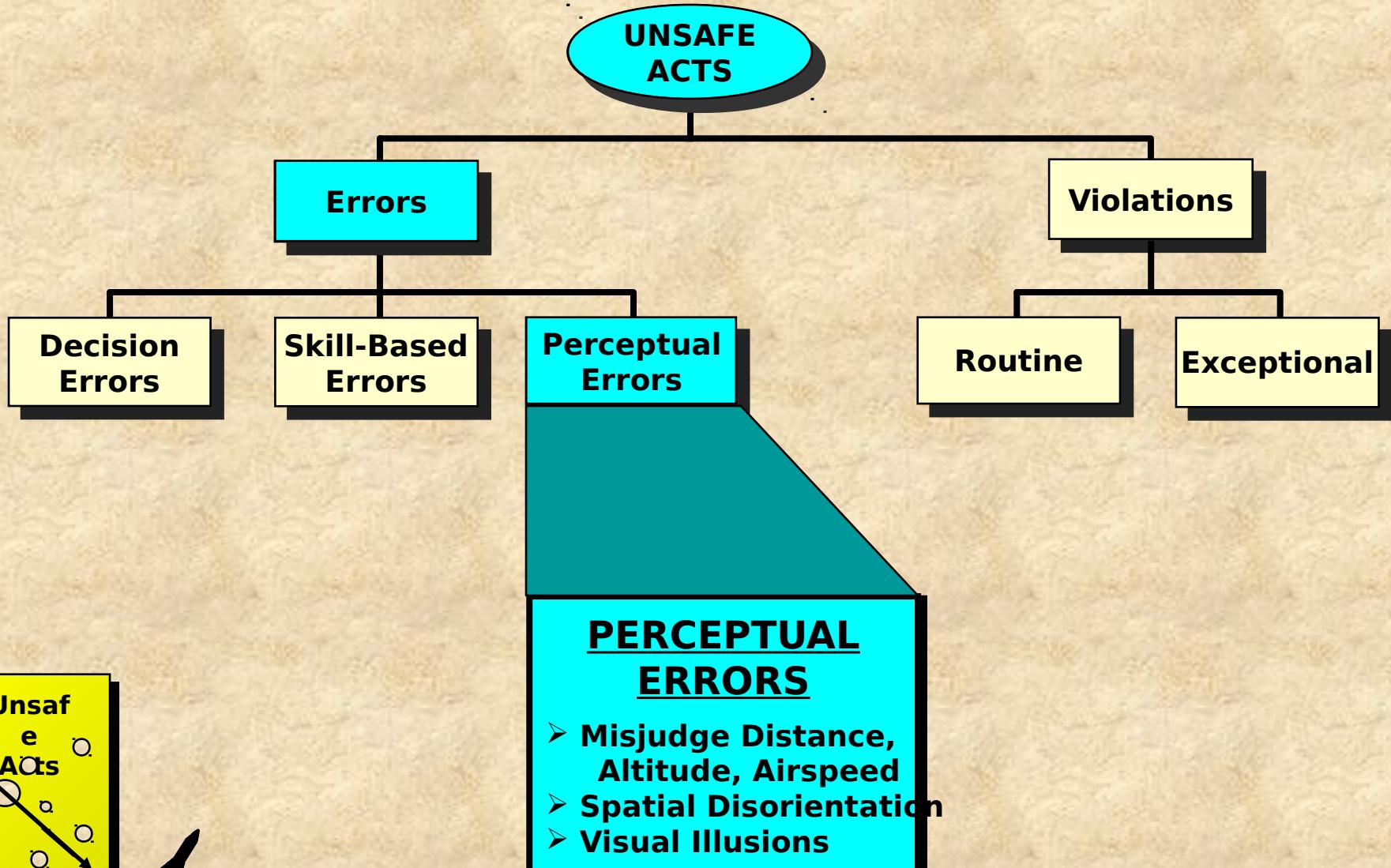


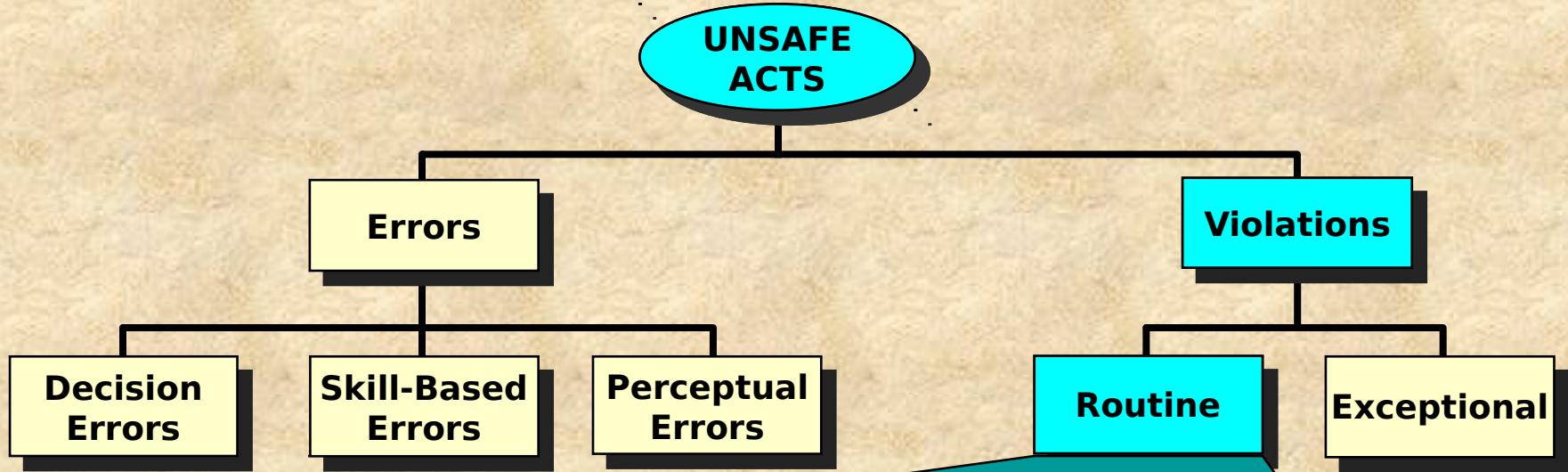


## SKILL-BASED ERRORS

- **Attention Failures**
  - Breakdown in visual scan
  - Inadvertent operation of control
  - Failure to see and avoid
- **Memory Failure**
  - Omitted item in checklist
  - Omitted step in procedure







## ROUTINE (INFRACTIONS)

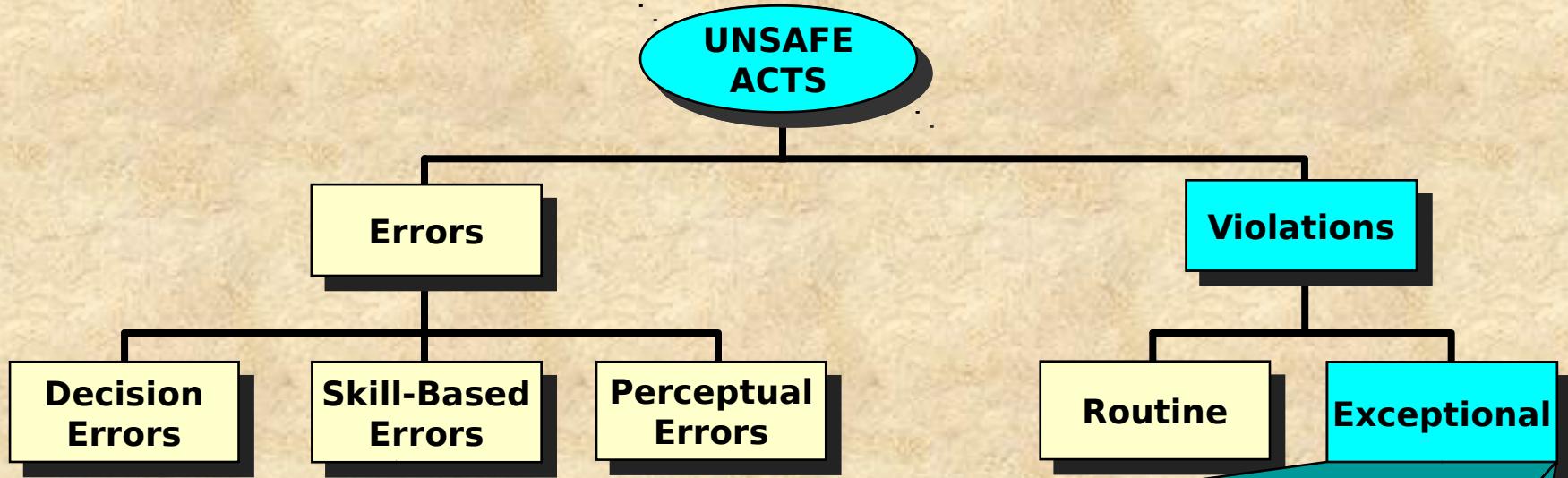
(Habitual departures from rules condoned by management)

### ➤ Violation of Orders/Regulations/SOP

- Failed to Inspect ACFT after In-Flight Caution Light
- Violated Squadron SOP Restricting Flight Below 500'
- Failed to Comply with NATOPS During Streaming
- Conducted Night Training and Ops Mission with PAX
- Elected to File VFR in Marginal Weather Conditions
- Failed to Use Radar Advisories from ATC
- Inadequate Brief and Limits on Mission
- HAC Knowingly Accepted Non-Current Crew

- Failed to Adhere to Brief
- Not Current/Qualified for Mission
- Improper Procedure

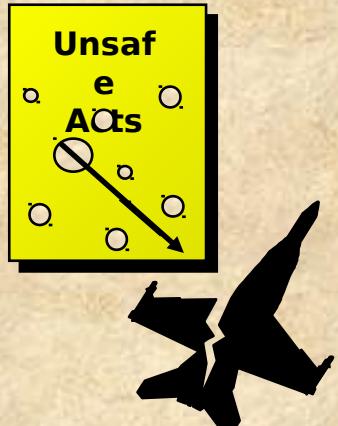




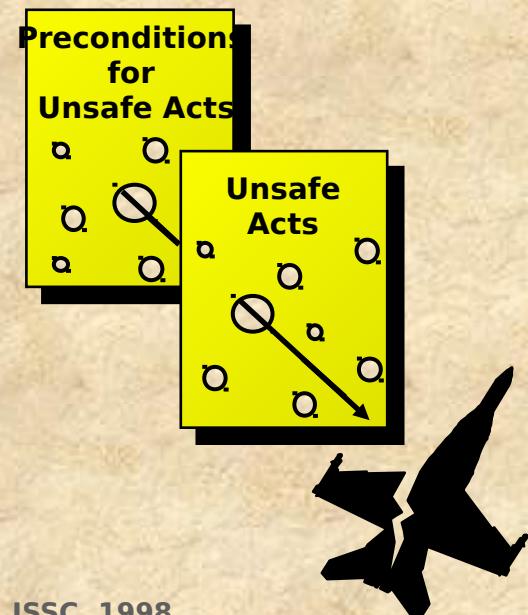
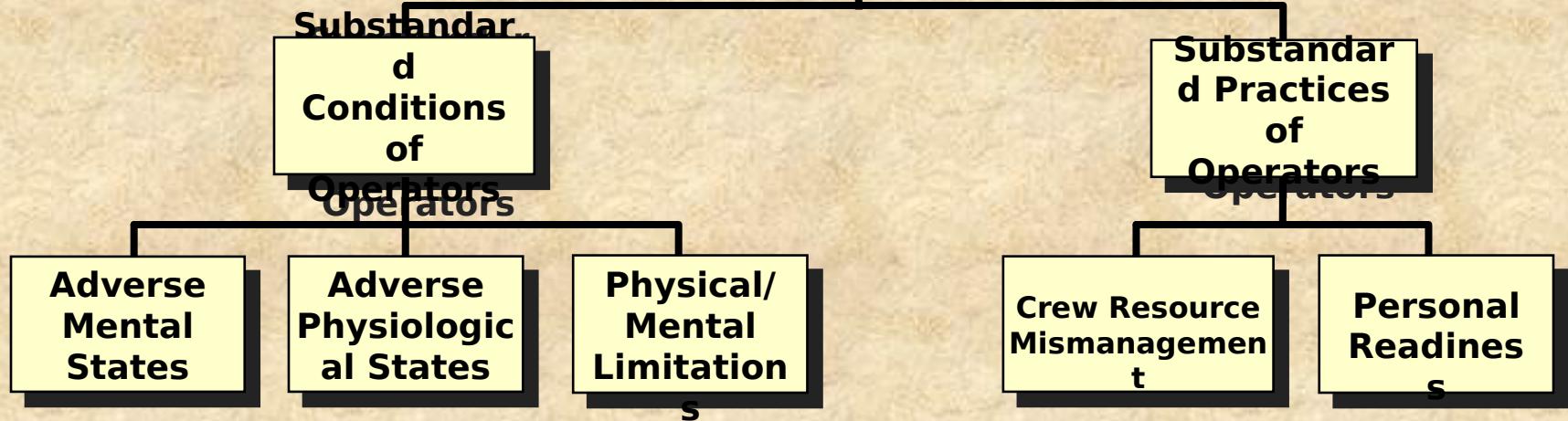
## EXCEPTIONAL

(Isolated departures from the rules not condoned by management)

- **Violated NATOPS/Regulations/SOP**
  - Performed Unauthorized Acrobatic Maneuver
  - Canyon Running
  - Failed to Complete Performance Computations for Flight
  - Improper Takeoff Technique
  - Failed to Obtain Valid Weather Brief
- **Accepted Unnecessary Hazard**
- **Not Current/Qualified for Mission**
- **Exceeded Limits of Aircraft**



## PRECONDITIONS FOR UNSAFE ACTS



## PRECONDITIONS FOR UNSAFE ACTS

### Substandard Conditions of Operators

Conditions  
of  
Operators

Operators

### Substandard Practices of Operators

Practices  
of  
Operators

Adverse  
Mental  
States

Adverse  
Physiologic  
al States

Physical/  
Mental  
Limitation

Crew Resource  
Mismanagement

Personal  
Readines  
s

Preconditions  
for  
Unsafe Acts

Unsafe  
Acts

## ADVERSE MENTAL STATE

- Loss of Situational Awareness
- Circadian dysrhythmia
- Alertness (Drowsiness)
- Overconfidence
- Complacency
- Task Fixation

## PRECONDITIONS FOR UNSAFE ACTS

### Substandard Conditions of Operators

Substandard Practices of Operators

Adverse Mental States

Adverse Physiological States

Physical/Mental Limitations

Crew Resource Mismanagement

Personal Readiness

## ADVERSE PHYSIOLOGICAL STATES

- G-induced Loss of Consciousness
- Hypoxia
- Motion Sickness
- Medical Illness
- Intoxication



## PRECONDITIONS FOR UNSAFE ACTS

### Substandard Conditions of Operators

Adverse  
Physiologic  
al States

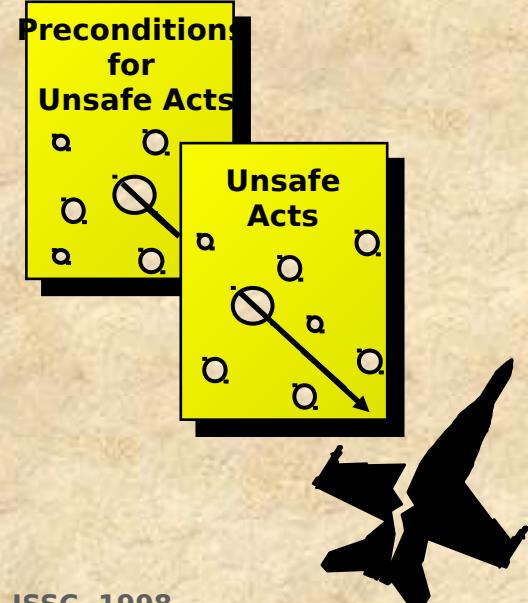
Adverse  
Mental  
States

Physical/  
Mental  
Limitation

### Substandard Practices of Operators

Crew Resource  
Mismanagement

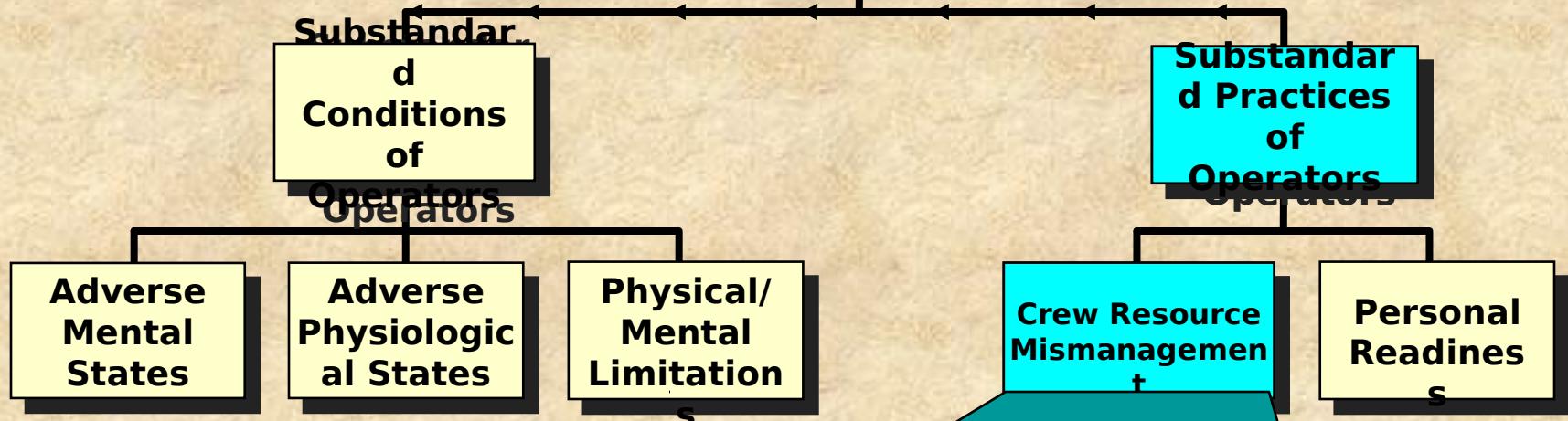
Personal  
Readiness



## PHYSICAL/MENTAL LIMITATIONS

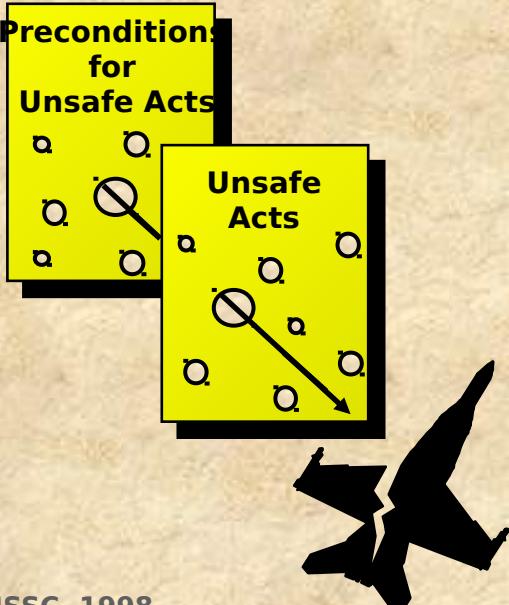
- Lack of Sensory Input
- Limited Reaction Time
- Incompatible Physical Capabilities
- Incompatible Intelligence/Aptitude

## PRECONDITIONS FOR UNSAFE ACTS

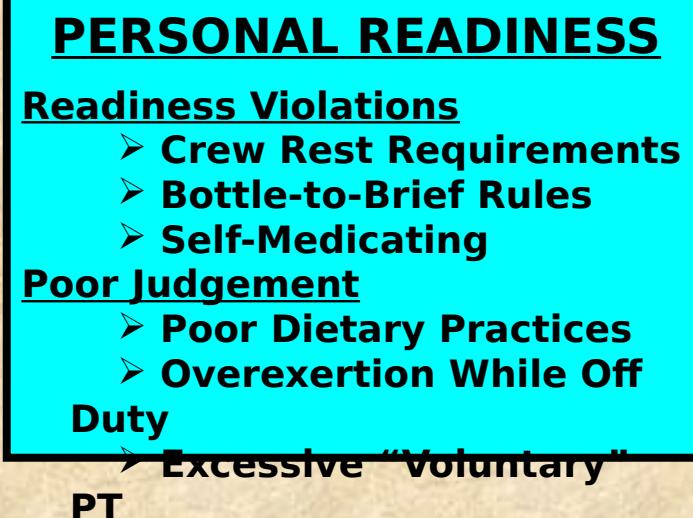
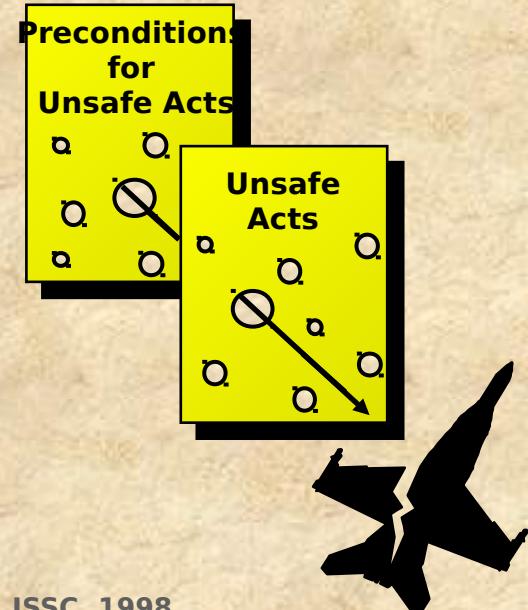
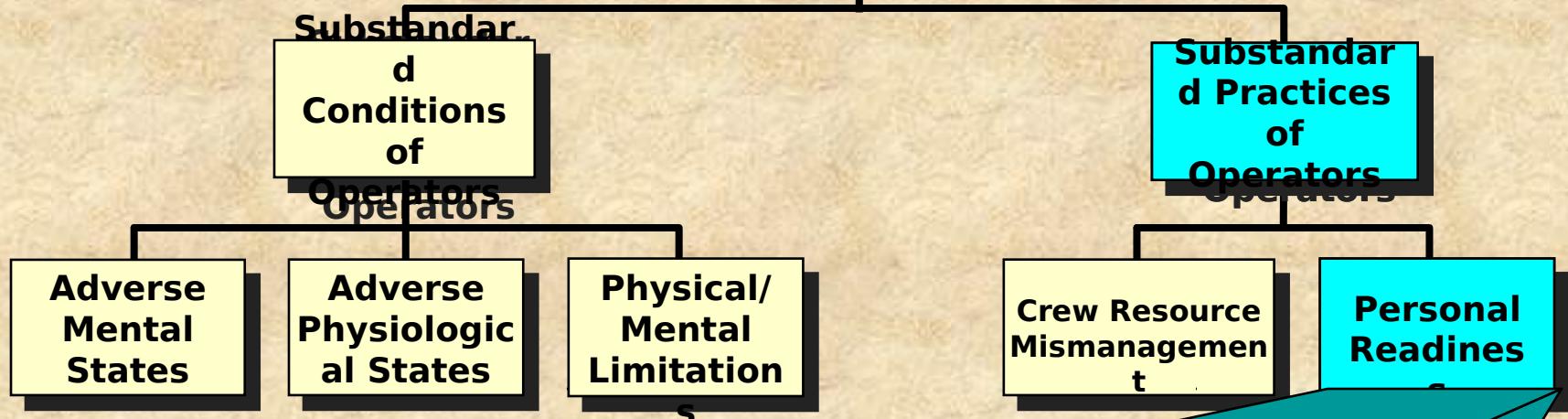


### CREW RESOURCE MISMANAGEMENT

- Not Working as a Team
- Poor Aircrew Coordination
- Improper Briefing Before a Mission
- Inadequate Coordination of Flight



## PRECONDITIONS FOR UNSAFE ACTS



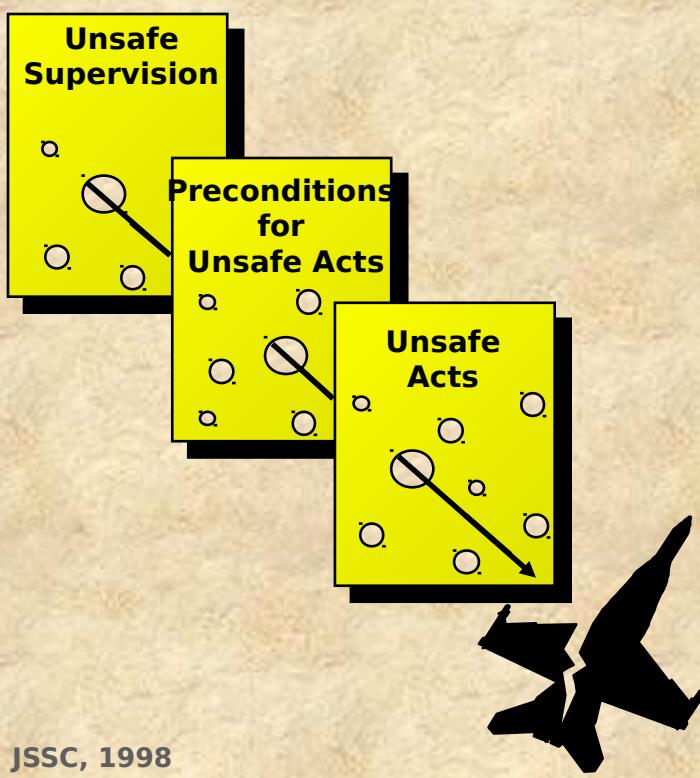
## UNSAFE SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Problem

Supervisory Violations



## UNSAFE SUPERVISION

Inadequate Supervision

Planned  
Inappropriate  
Operations

Failed to  
Correct  
Problem

Supervisory  
Violations

### INADEQUATE SUPERVISION

- Failure to Administer Proper Training
- Lack of Professional Guidance

Unsafe  
Supervision

Preconditions  
for  
Unsafe Acts

Unsafe  
Acts

## UNSAFE SUPERVISION

Inadequate Supervision

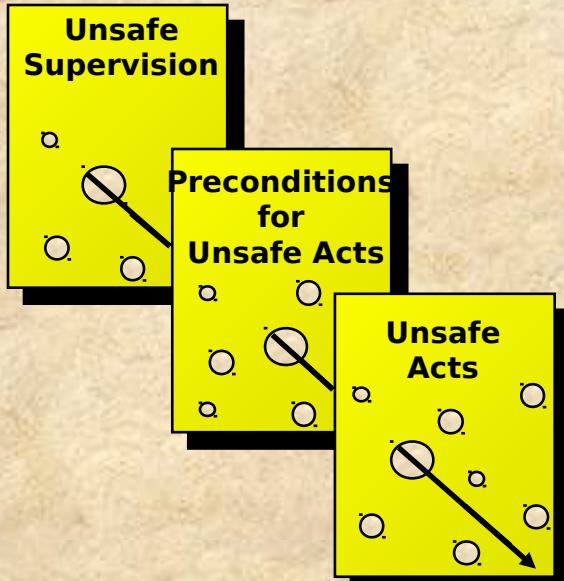
Planned Inappropriate Operations

Failed to Correct Problem

Supervisory Violations

### PLANNED INAPPROPRIATE OPERATIONS

- Mission Risk without Benefit
- Improper Work Tempo
- Poor Crew Pairing



## UNSAFE SUPERVISION

Inadequate Supervision

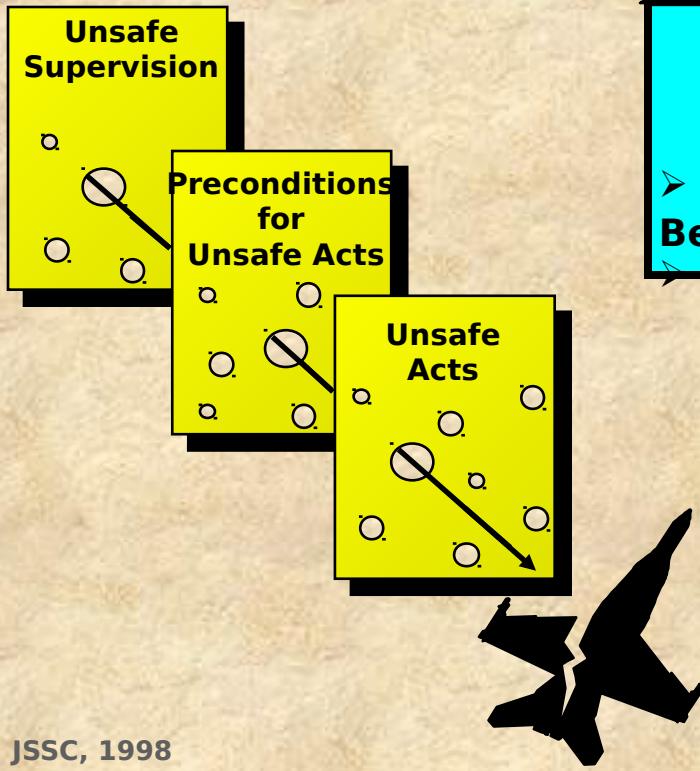
Planned Inappropriate Operations

Failed to Correct Problem

Supervisory Violations

### FAILED TO CORRECT A KNOWN PROBLEM

- Failure to Correct Inappropriate Behavior
- Failure to Correct a Safety Hazard



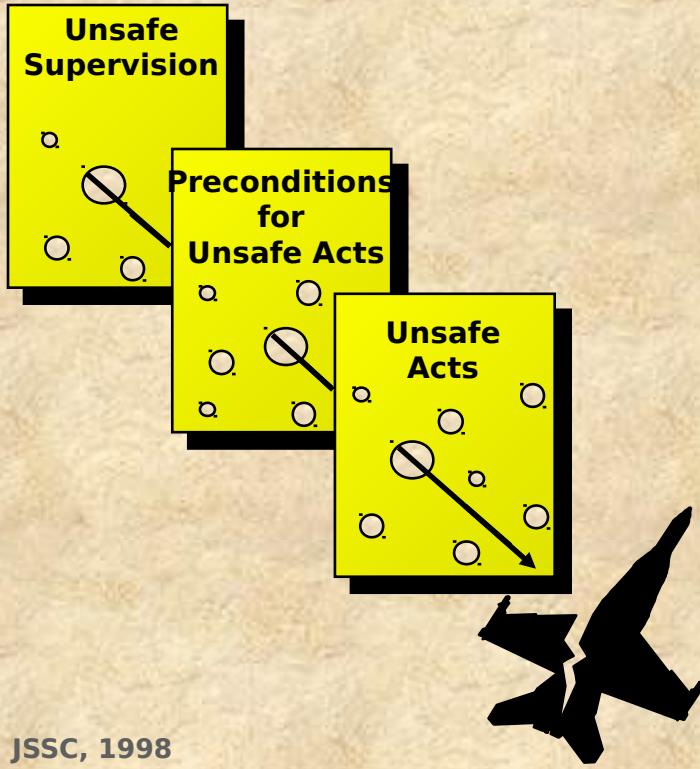
## UNSAFE SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Problem

Supervisory Violations



### SUPERVISORY VIOLATIONS

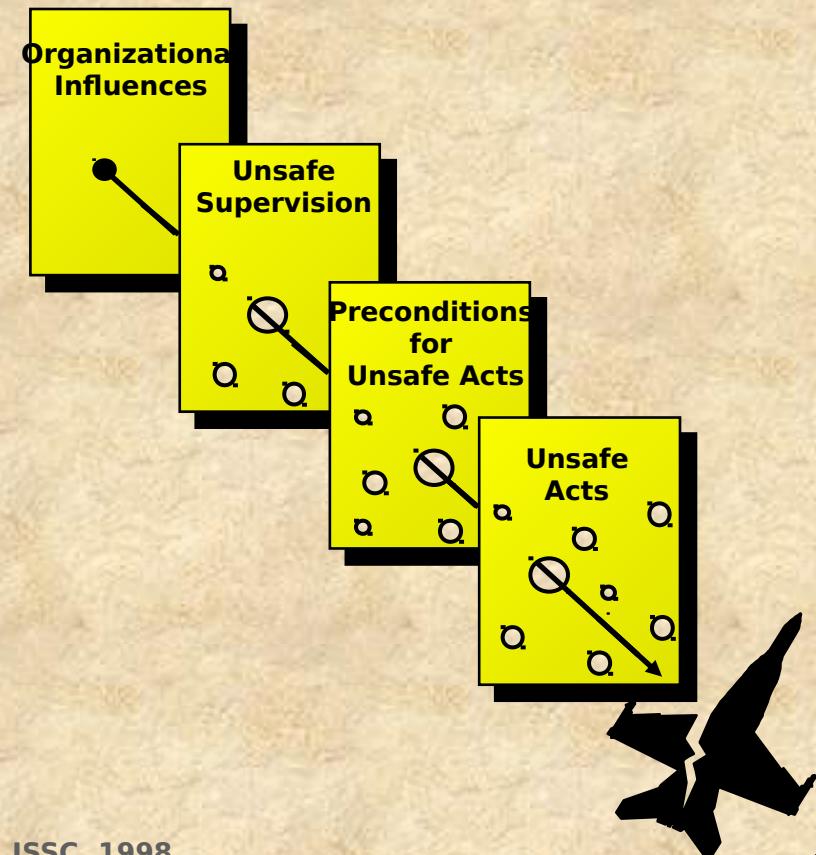
- Not Adhering to Rules and Regulations
- Willful Disregard for Authority by Supervisors

## ORGANIZATIONAL INFLUENCES

Resource Management

Organizational Climate

Operational Process



## ORGANIZATIONAL INFLUENCES

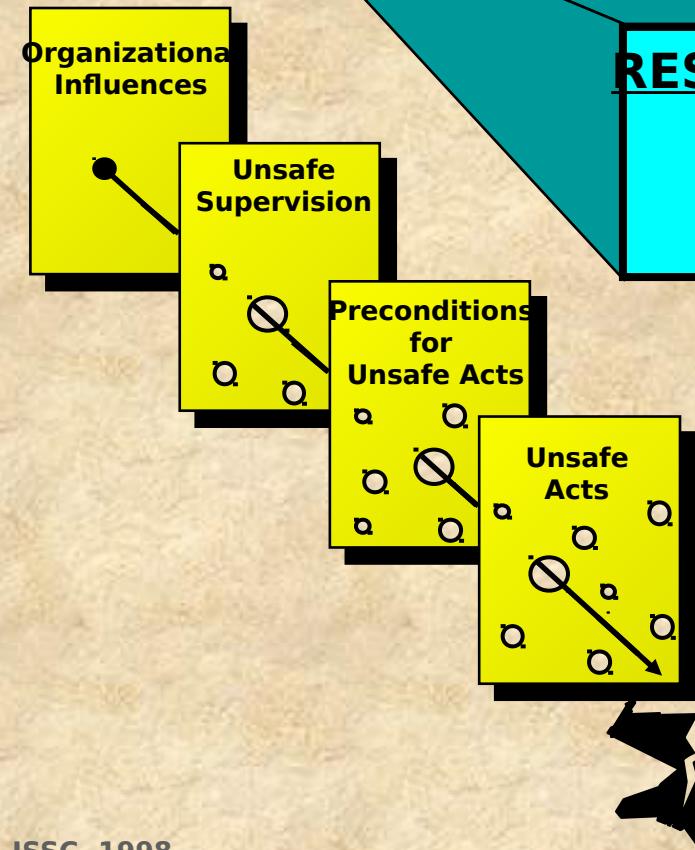
Resource Management

Organizational Climate

Operational Process

## RESOURCE MANAGEMENT

- Human
- Monetary
- Equipment/Facility



## ORGANIZATIONAL INFLUENCES

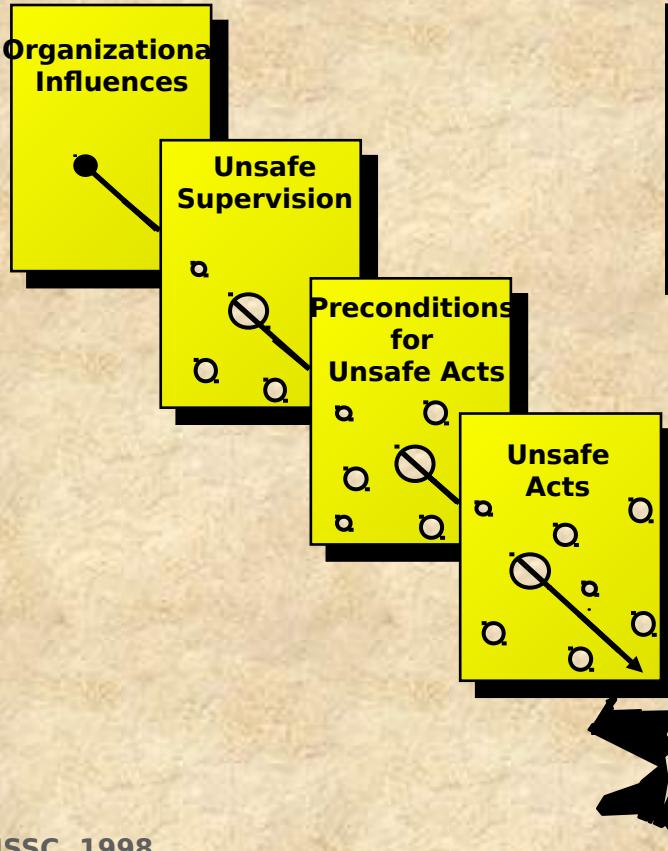
Resource Management

Organizational Climate

Operational Process

**ORGANIZATIONAL CLIMATE**

- Structure
- Policies
- Culture



## ORGANIZATIONAL INFLUENCES

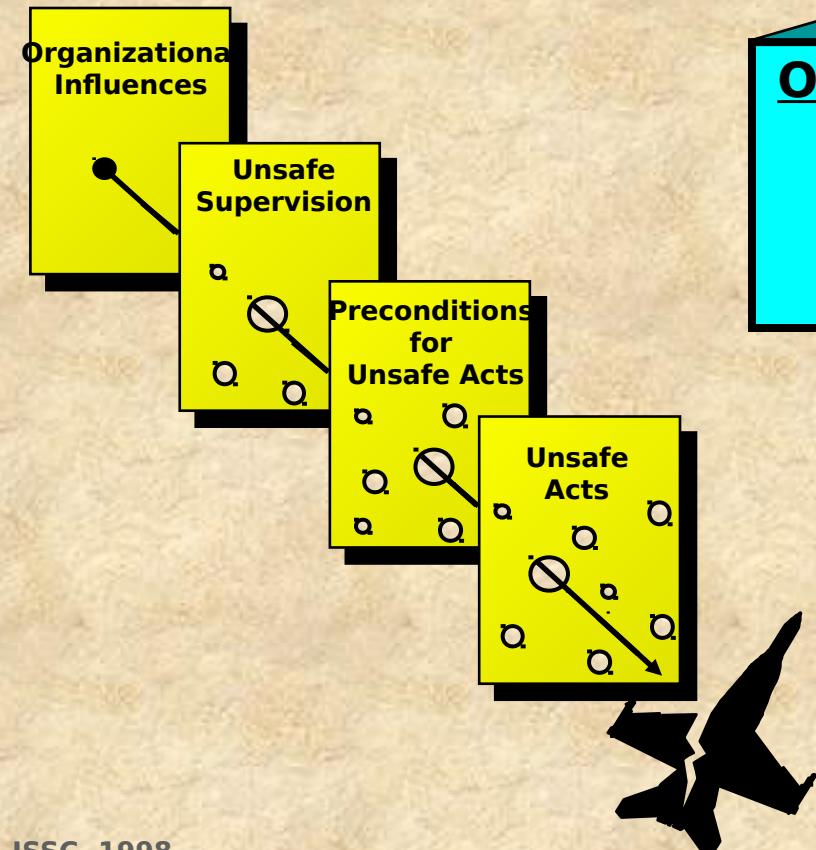
Resource Management

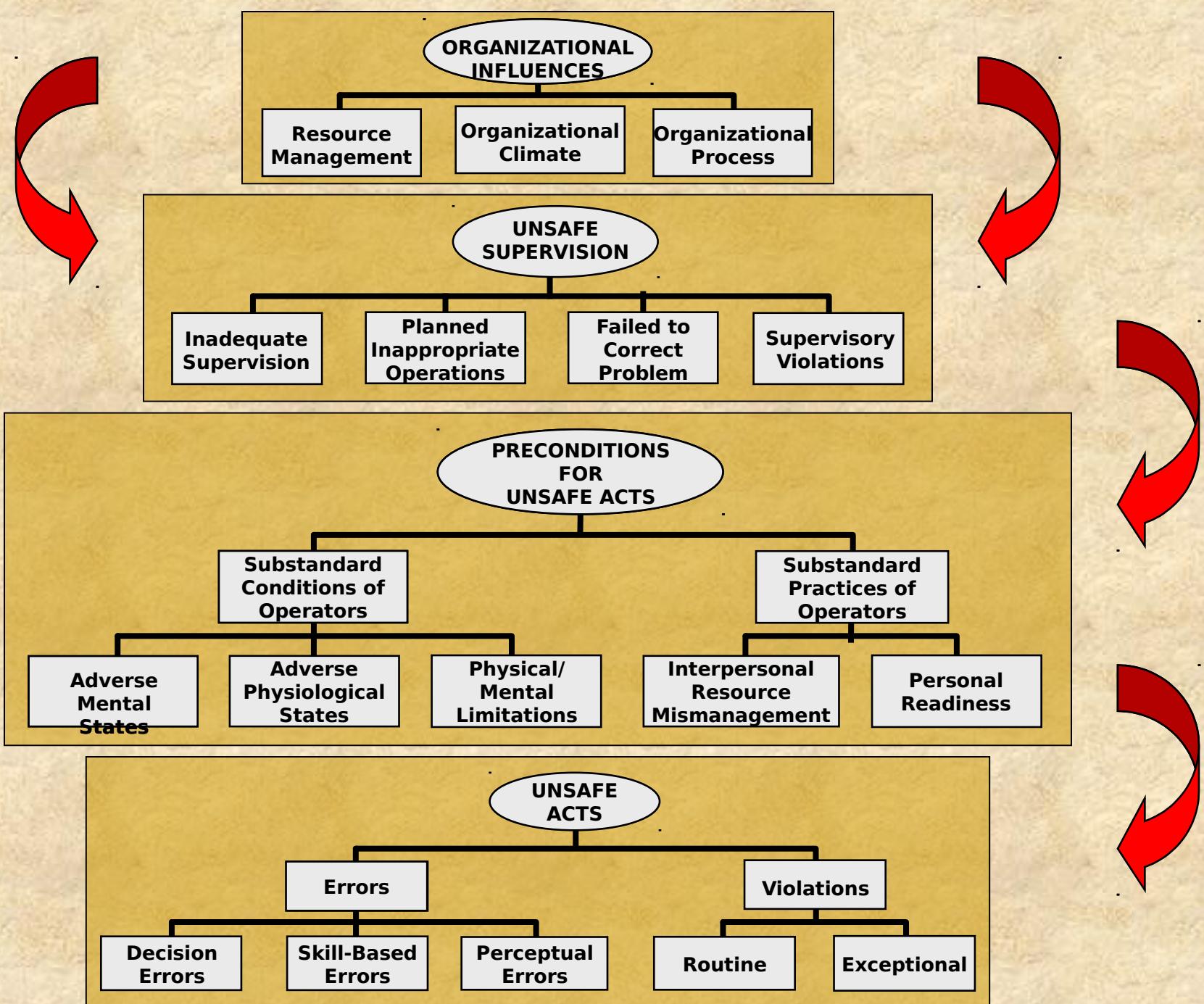
Organizational Climate

Operational Process

## OPERATIONAL PROCESS

- Operations
- Procedures
- Oversight





**“Whenever we talk about a pilot who has been killed in a flying accident, we should all keep one thing in mind. He...made a judgment. He believed in it so strongly that he knowingly bet his life on it. That his judgment was faulty is a tragedy,...**



**Every instructor, supervisor, and contemporary who ever spoke to him had the opportunity to influence his judgement, so a little bit of all of us goes with every pilot we lose.”**

**--Anonymous**